

ARCS PROCEDURE Author: M. Ritsche	CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE	PRO(LGR)-001.000 3 October 2006 Page 1 of 14
--------------------------------------	--	--

## Campbell CR23X Datalogger Replacement Procedure

### I. Purpose:

This procedure outlines steps for replacing a Campbell CR23X Micrologger on the SMET, SKYRAD, or GNDRAD systems at TWP facilities and the AMF site.

### II. Cautions and Hazards:

None.

### III. Requirements:

- Tools required:
  - 1 small flathead screwdriver
  - 1 black permanent marker

#### IV. Procedure:

##### A. Conditioning Replacement CR23X Prior to Installation

1. Plug the replacement CR23X datalogger into a 110-volt wall outlet using the 9591 power supply, assuming that the logger is mounted on the charging base. If not, power the datalogger using a 12-volt power supply connected to the datalogger face in the upper right-hand corner (see section 14 of *CR23X Micrologger Operator's Manual*).
2. Turn on the datalogger using the toggle switch on the right-hand side.
3. Wait for the datalogger to power up and go through startup. The word "HELLO" is displayed during this process. When the memory size is displayed (i.e., "1664 K bytes"), continue with step 4.
4. Using the keypad, press **[\*] + [A]**. See Table 1 for a description of the "\*A" mode (also see page 1-8 of *CR23X Micrologger Operator's Manual*).

<u>Keypad Entry</u>	<u>Display</u>	<u>Description</u>
<b>[*] + [A]</b>	01:XXXX	Input Storage Locations
<b>[A]</b>	02:XXXX	Intermediate Storage Location
<b>[A]</b>	03:XXXXX	Final Storage Area 2 Locations
<b>[A]</b>	04:XXXXX	Final Storage Area 1 Locations
<b>[A]</b>	05:+XXXXX	Bytes Allocated for User Program
<b>[A]</b>	06:+XXXXX	Bytes in Free Program Memory
<b>[A]</b>	07:+XXXXX	Program Bytes Available
<b>[A]</b>	08:+XXXXX	Label Bytes used
<b>[A]</b>	09:+XXXXX	Label Bytes free

Table 1

Once **[\*] + [A]** is pressed, the logger is in what is called the "star-A mode." Pressing **[A]** on the keypad, you can "Advance" through locations 01, 02, 03..., and you can go "Backwards" pressing **[B]** (i.e., 04, 03, 02...).

1. Advance to the 05 location in the star-A mode. Using the keypad, advance until the display shows "05:+XXXXX" (XXXXX indicates some numbers). Using the keypad, type in **[9] [8] [7] [6] [5]** then **[A]**. This completely resets the datalogger. It will erase any data in memory and any other programs currently loaded into the program storage area. This

<p>ARCS PROCEDURE</p> <p>Author: M. Ritsche</p>	<p>CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE</p>	<p>PRO(LGR)-001.000</p> <p>3 October 2006 Page 3 of 14</p>
---	--	--

step is important, as it will prevent erroneous data from getting into a particular data stream (e.g., GNDRAD into SKYRAD or SMET). **Note: This process takes approximately 5 minutes and can be aborted by pressing any key on the keypad.**

- Once this is finished, turn off the datalogger using the toggle switch on the right-hand side and disconnect it from whichever power source used.

### B. Conditioning In-Use CR23X Prior to Replacement

- Open the datalogger enclosure to access the CR23X. Using a small flathead screwdriver, **tighten all connections** on the wiring panel portion of the datalogger where wiring from sensors are connected. This will allow the removable connectors to be separated from the logger without losing connections and cause rewiring to be necessary.
- With a permanent marker, mark each of the green removable wiring connectors as “1,” “2,” “3,” and “4,” and make a corresponding label on the datalogger (see Figure 1).

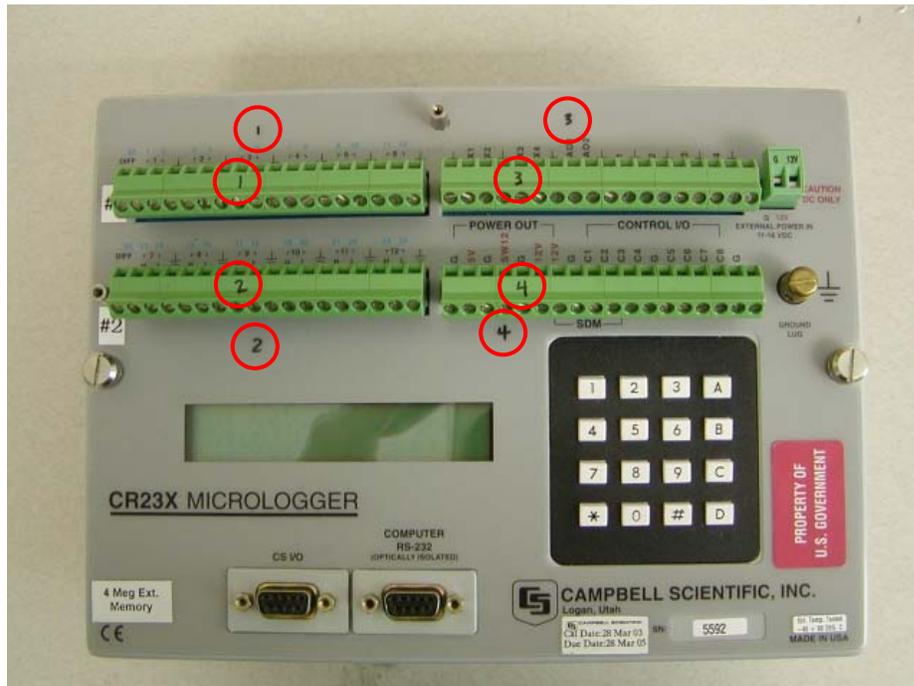


Figure 1

- Remove any tension reducers that may be connected to the datalogger, such as zip ties or twist ties that may be securing any sensor/communication wires. Loosen the RS-232 connector mount

<p>ARCS PROCEDURE</p> <p>Author: M. Ritsche</p>	<p>CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE</p>	<p>PRO(LGR)-001.000</p> <p>3 October 2006 Page 4 of 14</p>
---	--	--

screws, but do not remove the connector from the datalogger at this time.

### C. Preparing Collection System for CR23X Replacement

1. Minimize all RMC data displays to access the LoggerNet menu bar (see Figure 2).

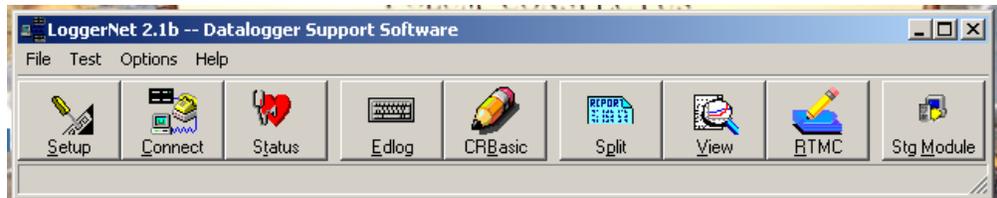


Figure 2

2. Click on **Setup** to access the communications protocols for the connectivity to the datalogger and collection of data.
3. Click on the **IPMet.31** root located in the left hand Setup window. Uncheck the **Communications Enabled** box to disable communication to the datalogger (see Figure 3).

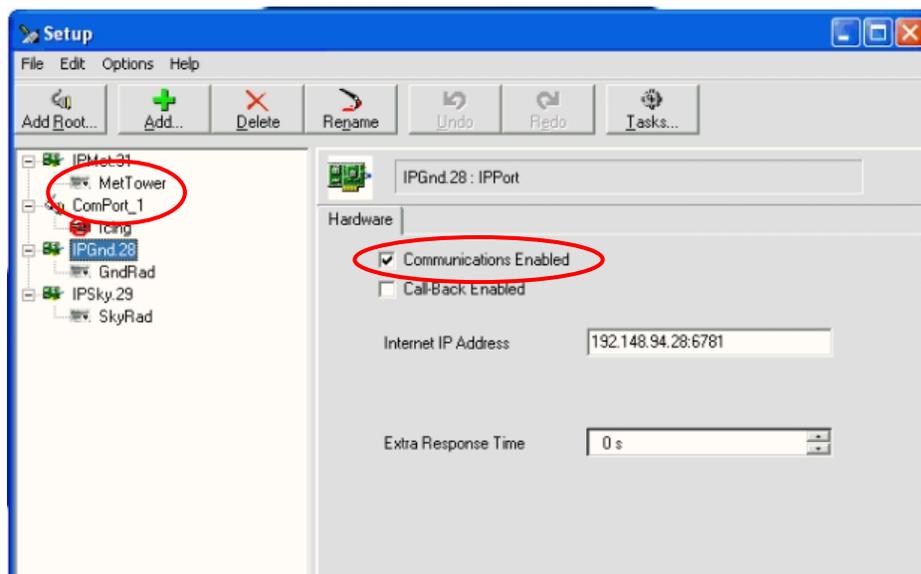


Figure 3

4. Click on the **MetTower** sub-root below IPMet.31 so the rest of the communication protocol tabs are available.

- a) Under the **Hardware** tab, uncheck the **Communications Enabled** box (see Figure 4).

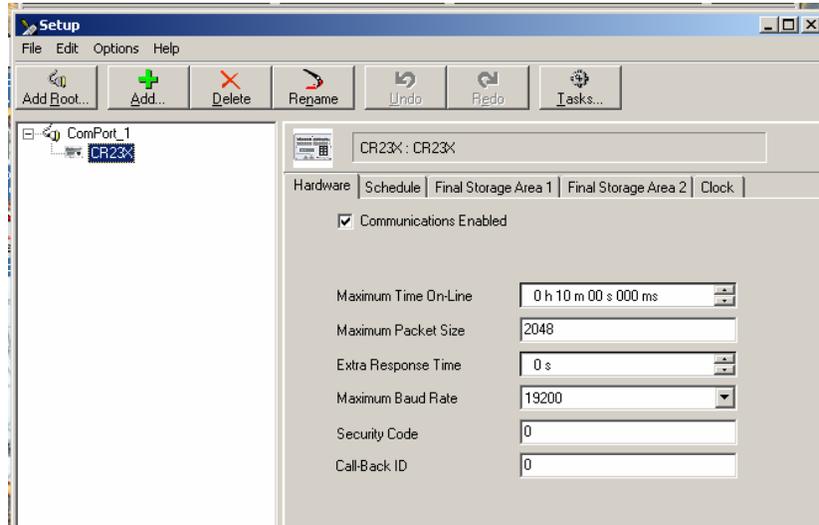


Figure 4

- b) Under the **Schedule** tab, uncheck the **Scheduled Collection Enabled** box. Leave all other settings as they are (Figure 5).

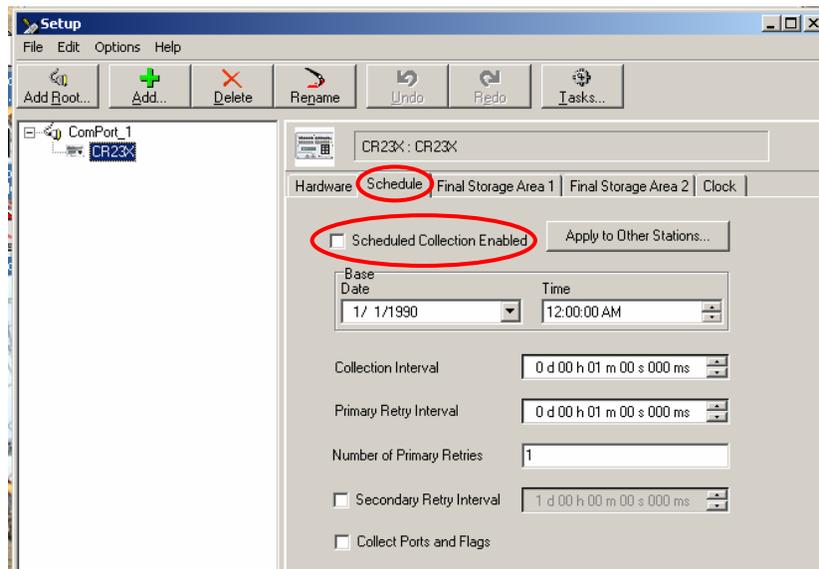


Figure 5

- c) Under the **Final Storage Area 1** tab, uncheck the **Enabled for Connection** box. Leave all other setting as they are (see Figure 6).

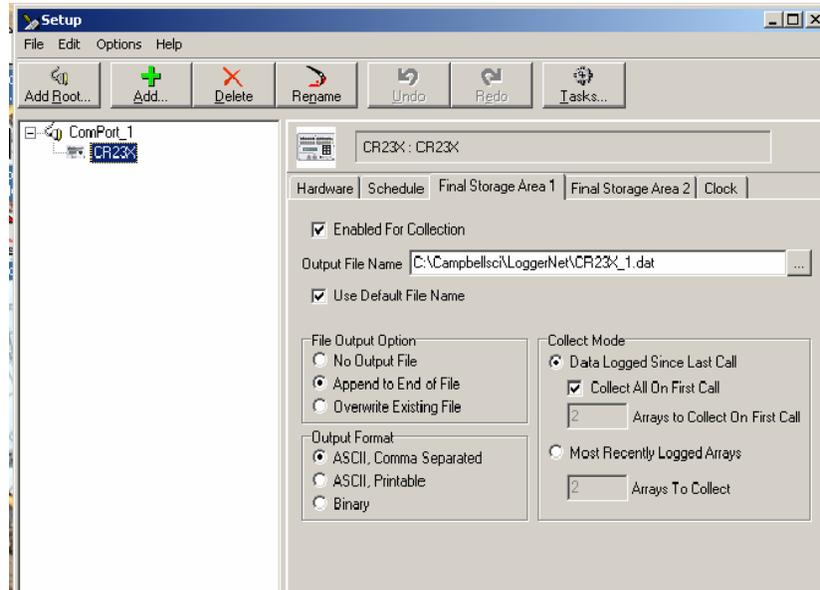


Figure 6

5. Click on the **Apply** button on the bottom. Communication to the datalogger is now disabled, and replacement can begin.

## D. Replacing CR23X Datalogger

1. Prepare replacement logger.
  - a) Loosen two silver mount screws that secure the replacement datalogger to the battery/charger base (see Figure 7).



Figure 7

- b) Disengage removable wiring connectors by firmly pulling them straight upward and away from the face of the datalogger (see Figure 8). Try not to angle them to the left or right as it will bend the connectors underneath. If bending occurs, straighten the pins out gently using needle nose pliers or a similar tool.



Figure 8

ARCS PROCEDURE	CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE	PRO(LGR)-001.000
Author: M. Ritsche		3 October 2006 Page 8 of 14

- c) Pull datalogger faceplate away from the battery/charger base to access the power connector (see Figure 9). Grab the white power connector that contains the black and red wires (the only connector going to the logger). Pinch the tab along the side and pull downward to disconnect the connector (see Figure 10).

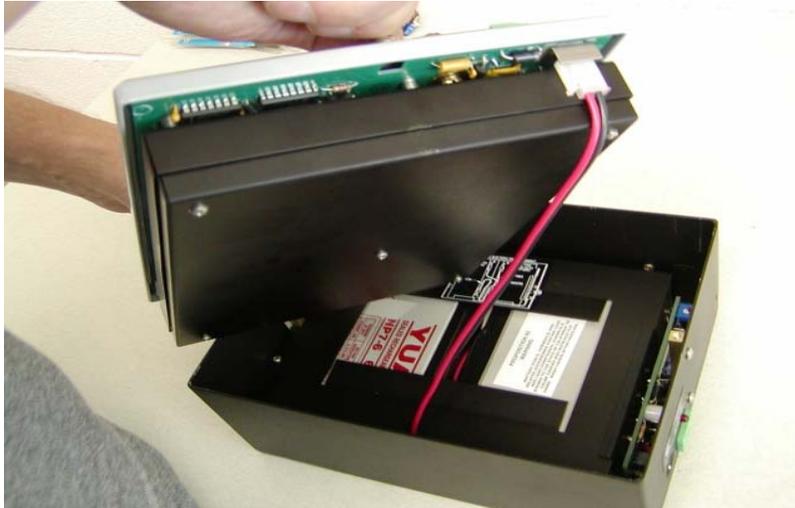


Figure 9

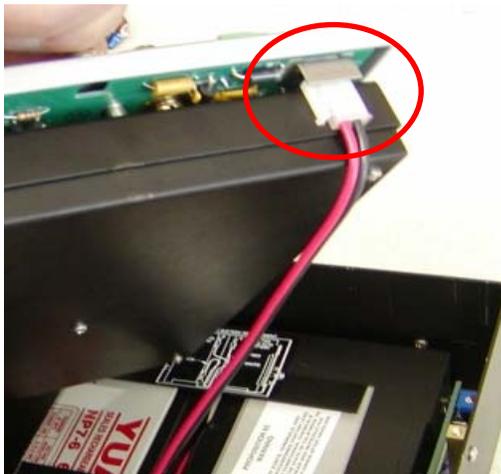


Figure 10

- d) The replacement datalogger is now ready for installation. Record the serial number and send it to the system mentor.

ARCS PROCEDURE	CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE	PRO(LGR)-001.000 3 October 2006 Page 9 of 14
Author: M. Ritsche		

2. Take the replacement datalogger to the logger enclosure in the instrument field, and begin to remove the existing datalogger.
  - a) Turn off power to the datalogger by flipping the toggle switch on the right-hand side of the battery/charger base.
  - b) Remove each of the four green wiring connectors (ensure they are labeled correctly), and set them aside. **Caution: Do not pull on the sensor wires.**
  - c) Remove the datalogger ground wire by loosening the copper lug just up and left of the right-hand sliver mount screw.
  - d) Disconnect the RS-232 9-pin connector and set it aside.
  - e) Loosen two silver mount screws that secure the datalogger to the battery/charger base.
  - f) Pull datalogger faceplate away from the battery/charger base to access the power connector.
  - g) Grab the white power connector that contains black and red wires. Pinch the tab along side and pull downward to disconnect the connector.
3. Install replacement datalogger.
  - a) Connect the white power connector to the datalogger.
  - b) Set the datalogger into the battery/charger base.
  - c) Tighten two silver mount screws.
  - d) Connect the RS-232 9-pin connector to the datalogger.
  - e) Connect the ground wire.
  - f) Attach the four green wiring connectors.
  - g) Secure any loose wires with cable ties or twist ties.
4. Turn on the datalogger by flipping the toggle switch on the right-hand side of the battery/charger base. The word "HELLO" should appear in the display. If not, check the connection of the white power connector. If problem persists, replace with another logger. If the problem continues after installing the second unit, contact the system mentor.

## E. Establishing Communication and Data Collection System

1. Once the CR23X datalogger has been replaced, return to the collector computer and access the **LoggerNet** menu bar (see Figure 11).

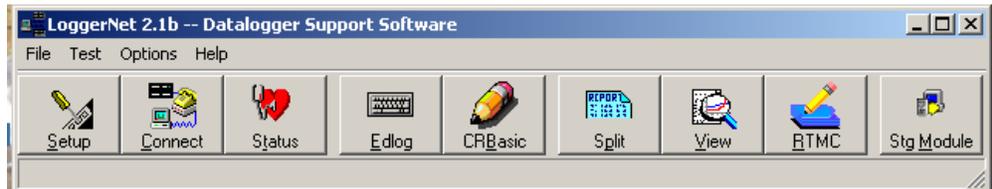


Figure 11

2. Click on the **Setup** button to access the **Setup** menu. And then, click on the **IPMet.31** root located in the left-hand window (see Figure 12).
3. Under the **Hardware** tab, check the **Communications Enabled** box (see Figure 12).

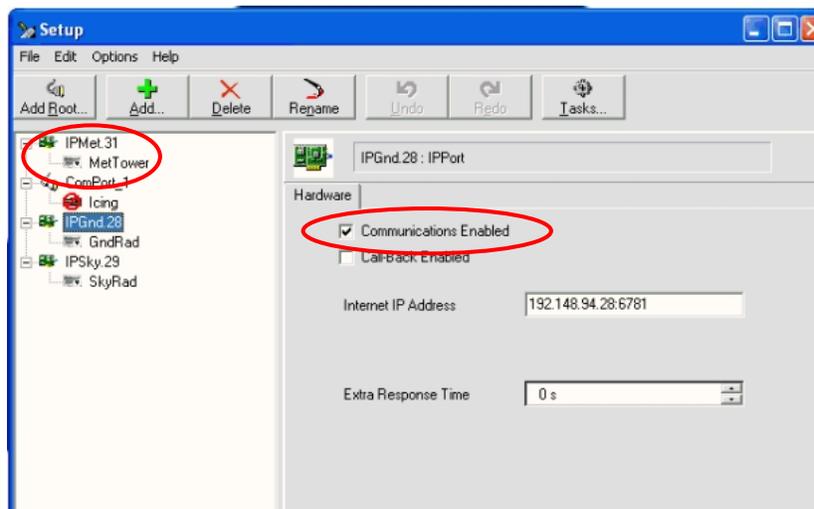


Figure 12

4. Close the **Setup** window.
5. Click on the **Connect** button on the **LoggerNet** main menu bar (see Figure 13).

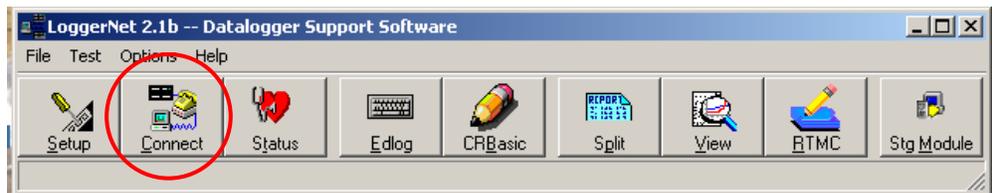


Figure 13

6. The **Connect Screen** window appears.
7. Under **Stations**, select the system in which the datalogger was just replaced. When it is highlighted in blue, go to the **Control** section and click on the **Connect** button (see Figure 14). The two wires should connect and the button will change to **Disconnect**. If **LoggerNet** cannot establish connection, check all communication wiring and hardware for proper function. If the problem persists, contact the system mentor.

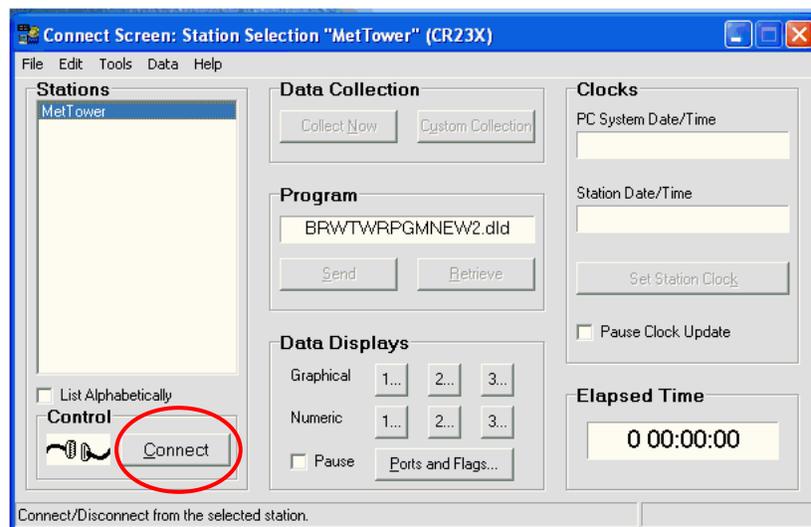


Figure 14

8. Once communication between the logger and the PC has been established, update the datalogger clock.
  - a) Under **Clocks**, click on the **Set Station Clock** button to match the datalogger clock to the PC clock.
9. Under **Program**, click on the **Send** button to load the correct program to the datalogger. Contact the system mentor if there is any question as to which program to load. There should be only one **.dld** file in the folders:
  - a) C:\GndRadPgm

- b) C:\SkyRadPgm
  - c) C:\MetTowerPgm
- Click **OK** when prompted by the **Caution** box warning that all station data will be lost.
10. Once the program has been sent, click on the **Disconnect** button under **Control**. Close the **Connect Screen** window.
  11. ON the **LoggerNet** main menu, click on the **Setup** button.
  12. Click on the **MetTower** sub-root below **IPMet.31** so the rest of the communication protocol tabs are available.
    - a) Under the **Hardware** tab, check the **Communications Enabled** box (see Figure 15).

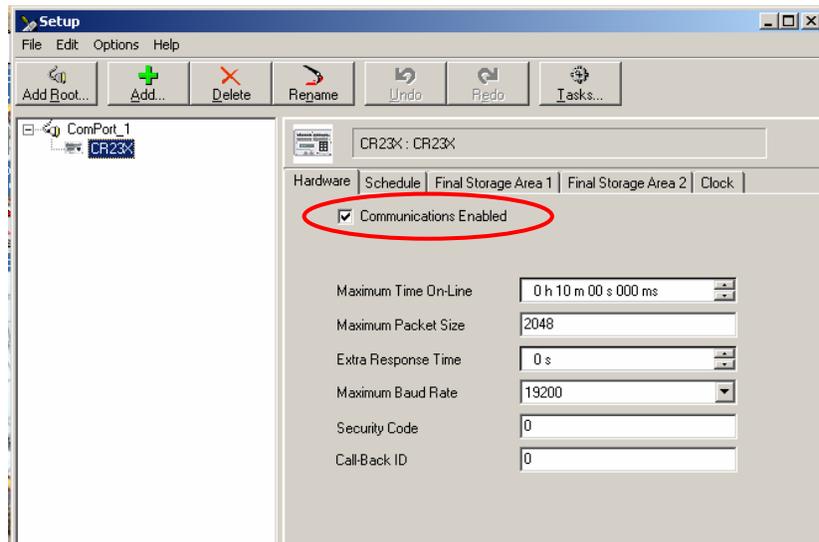


Figure 15

- b) Under the **Schedule** tab, check the **Scheduled Collection Enabled** box (see Figure 16). Leave all other settings as they are.

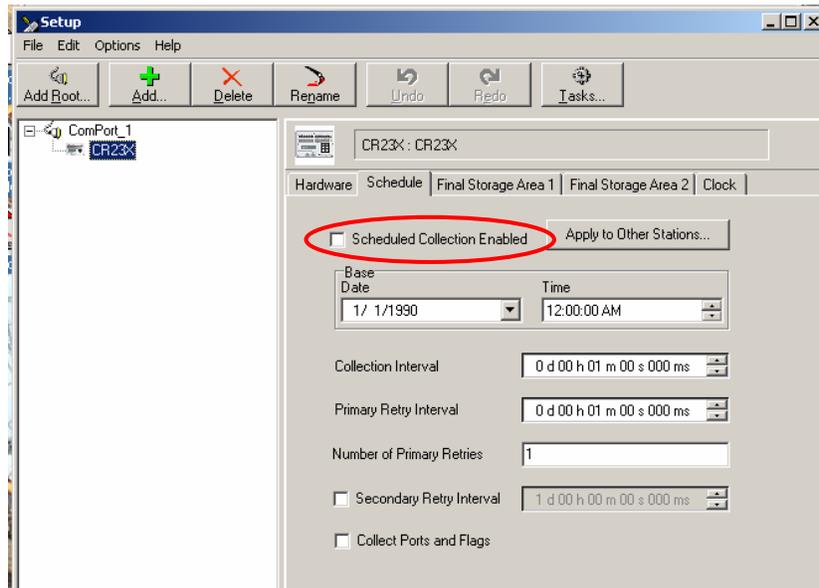


Figure 16

- c) Under the **Final Storage Area 1** tab, check the **Enabled for Connection** box (see Figure 17). Leave all other settings as they are.

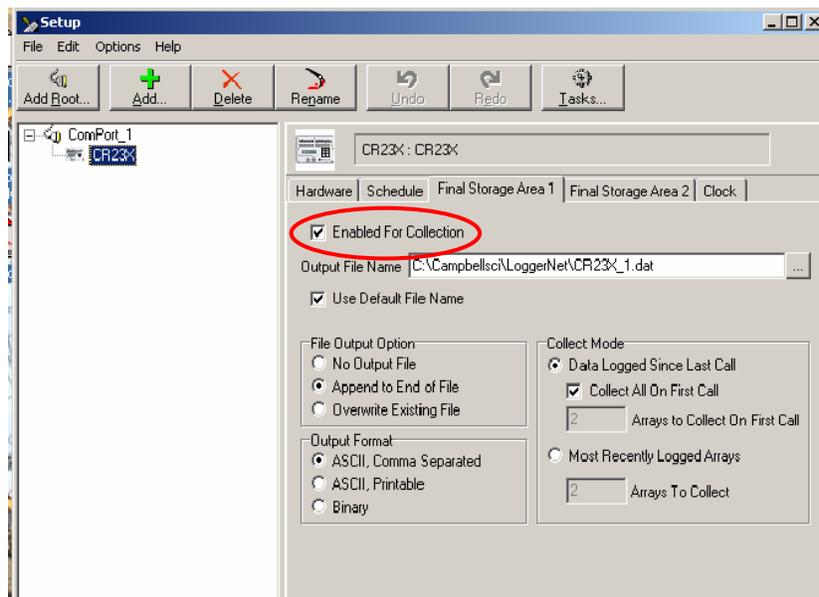


Figure 17

ARCS PROCEDURE Author: M. Ritsche	CAMPBELL CR23X DATALOGGER REPLACEMENT PROCEDURE	PRO(LGR)-001.000 3 October 2006 Page 14 of 14
--------------------------------------	--	---

- d) Click **Apply** on the bottom. Communication to the datalogger is now enabled, and data flow should begin.

**V. References:**

1. CR23X Micrologger Operator's Manual, MAN(LGR)-001.000.

**VI. Attachments:**

None.